WASHINGTON STATE DEPARTMENT OF ECOLOGY

January 2016

CONDITIONAL USE LEVEL DESIGNATION FOR PRETREATMENT (TSS)

For

BaySaver Technologies™ BaySeparator

Ecology's Decision:

Based on BaySaver Technologies™ application submissions Ecology hereby issues the following use level designation for the BaySaver Technologies™ BaySeparator units:

1. **Conditional Use Level Designation (CULD) for pretreatment, as defined in the 2011 Technical Guidance Manual for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE) , (a) ahead of infiltration treatment, or (b) to protect and extend the maintenance cycle of a basic or enhanced treatment device (e.g., sand or media filter). This CULD applies to BaySeparator units sized at an operating rate of no more than 0.82 gpm/ft^2 of manhole area (primary plus storage). Base the size of the BaySeparator unit on the water quality design flow rate as determined below.**

2. **Calculate the water quality design flow rate using the following procedures:**

   - **Western Washington: for treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.**

   - **Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.**

   - **Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.**

3. **All designations are subject to the conditions specified below.**

   - **Properly designed and operated BaySeparator systems may also have applicability in other situations (example: low-head situations such as bridges or ferry docks), for TSS and oil/grease removal where, on a case-by-case basis, it is found to be infeasible or impracticable to use any other approved practice. Jurisdictions covered under the Phase I or Phase II municipal stormwater permits should use variance/exception procedures and criteria as required by their NPDES permit.**

4. **Ecology finds that the BaySaver system could also provide water quality benefits in retrofit situations.**

5. **This CULD expires on August 1, 2016 unless extended by Ecology'**

Ecology's Conditions of Use:

1. **Design, assemble, install, operate, and maintain BaySeparators in accordance with BaySaver Technologies™ applicable manuals and documents and the Ecology decision and conditions specified herein.**

2. **On or before June 30, 2015, BaySaver Technologies™ shall submit a Quality Assurance Project Plan (QAPP) that meets the TAPE requirements for attaining a general use level designation (GULD) for pretreatment.**

3. **Discharges from the BaySeparator unit shall not cause or contribute to water quality standards violations in receiving waters.**

4. **BaySaver Technologies™ shall complete all required testing and submit a TER for pretreatment for Ecology review by May 1, 2016.**

5. **BaySaver Technologies™ may request Ecology to grant deadline or expiration date extensions, upon showing cause for such extensions. Lack of available funding is not a valid reason for an extension.**

Applicant: Advanced Drainage Systems - BaySaver

Applicant's Address: 4640 Truman Blvd
Hilliard, Ohio 43065

Application Documents:

- BaySaver Technologies, Inc. Technical Evaluation Engineering Report, BaySaver Technologies Inc., Revised 2008
- BaySaver Technologies, Inc. Technical Evaluation Engineering Report, BaySaver Technologies Inc., August 2006
- BaySaver Technologies, Inc. Technical Evaluation Engineering Report, BaySaver Technologies Inc., June 2005

- BaySaver Technologies™ Separation System Technical and Design Manual, BaySaver Technologies Inc.", March 2004
- Estimating the Maximum Treatment Rate and the Maximum Hydraulic Rate of the BaySaver Units, Omid Mohensi, September 2005
- List of Units Sold and Units Installed in Washington State, June, 2005

You may obtain a CD-ROM of the submittal reports by request from BaySaver Technologies™.

Applicant's Use Level Requests:

General use level designation (GULD) for pretreatment.

Applicant's Performance Claims:

Engineers can design and size BaySeparator units such that they remove 125-micron particles at an efficiency of 80%. Specifically, BaySeparator units: remove and retain sediment particles from stormwater runoff.

- Achieve an instantaneous removal efficiency if 80% or greater when properly sized for a selected design flowrate.
- Retain material through intense storms and do not resuspend previously trapped pollutants.
- Are easily maintained.

Ecology Recommendations: Based on the weight of the evidence and using its best professional judgment, Ecology finds that:

- The BaySaver units, sized according to this designation document can achieve, at a minimum, performance equivalent to a presettling basin as defined in the 2012 Stormwater Management Manual for Western Washington, Volume V, Chapter 6.

Findings of Fact:

- BaySaver conducted three series of full-scale laboratory on tests. They conducted the first series of tests on a 24" separator unit with two 72" manholes. On average, at 25% of the maximum treatment rate the unit can achieve 84% TSS removal of F-95 sand. They conducted the second series of tests on a 24" separator unit with a 48" primary manhole and a 72" storage manhole. On average at 15% of the maximum treatment rate, the unit can achieve 94% removal of F-95 sand. They conducted the third series of tests on a 24" separator unit with a 48" primary manhole and a 72" storage manhole with water at 20° Celsius (BaySaver conducted the first two series with water at near-freezing temperatures). On average at 25% of the maximum treatment rate, the unit can achieve 89.5% removal of F-95 sand.

Technology Description:

Reviewers can download the Design Manual and technical bulletins from the company's web site.

Recommended Research and Development:

Ecology encourages BaySaver Technologies™ to pursue continuous improvements to the BaySeparator unit. To that end, we recommend the following actions:

- Conduct field-testing to reliably ascertain the BaySaver's ability to remove the finer particles (based on the TAPE criteria) comprising TSS found on local highways, parking lots, and other high-use areas.
- Conduct field-testing to verify the appropriate maintenance practices.
- Conduct testing on various sized BaySeparator units to verify that the sizing technique is appropriate.
- Conduct testing to determine the flowrates that trigger maximum treatment operation and bypass operation.
- Conduct testing to determine the flowrate at which resuspension occurs.

Contact Information:

Applicant: Daniel Figola
Advanced Drainage Systems – BaySaver
4640 Trueman Blvd
Hilliard, Ohio 43065
(614) 658-0265
dfigola@ads-pipe.com

Applicant website: http://www.baysaver.com/

Ecology web link: http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html

Ecology Contact: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
douglas.howie@ecy.wa.gov
(360) 407-6444

Revision History

Date	Revision
April 2008	Original Draft use-level-designation document: CULD for pretreatment.
September 2008	Modified dates for QAPP, TER, and expiration
December 2012	Modified Design Storm Description, added Revision Table
December 2014	Revised QAPP, TER, and expiration dates
January 2016	Revised Manufacturer contact information